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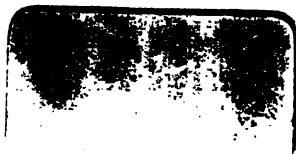
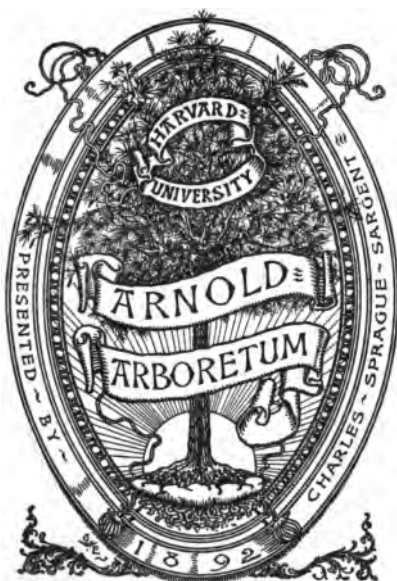
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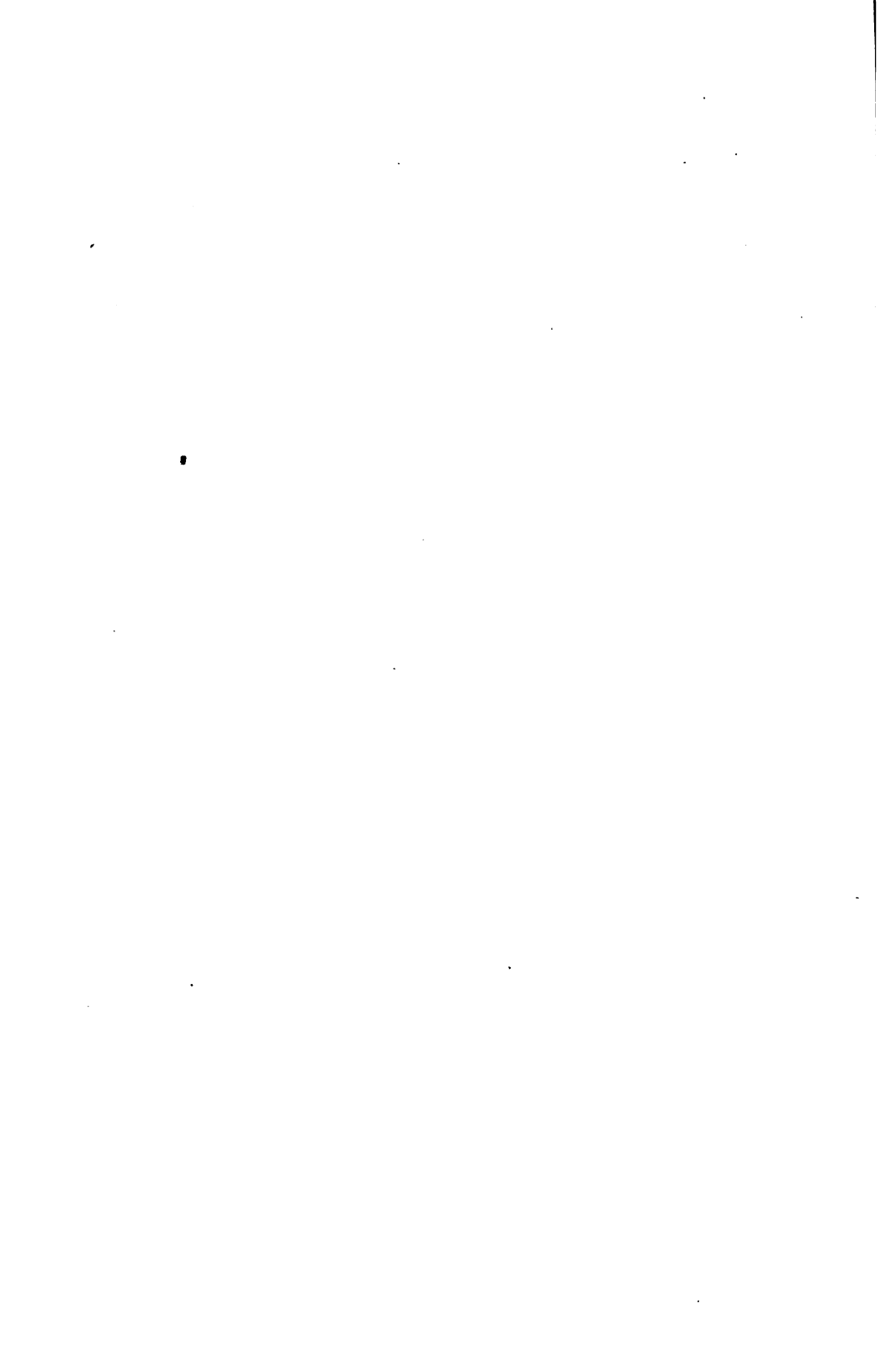


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Christy Esq
Wm Wetherby
AN
ESSAY

ON

The Geographical Distribution

OF

PLANTS,

THROUGH

THE COUNTIES

OF

NORTHUMBERLAND, CUMBERLAND, AND
DURHAM.

BY N. J. WINCH.

*Read at a Meeting of the Literary and Philosophical Society in
Newcastle upon Tyne, May 4th, 1819.*

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ON THE
Geographical Distribution
OF
PLANTS.

THE study of the Geography of Plants, though an interesting and important branch of Botany, has but lately engaged the attention of naturalists. A few detached hints on the subject are to be met with in the writings of Linnæus, who observes, that "the different kinds of plants, show by their stations the perpendicular height of the earth," and some unconnected facts are scattered through the works of the older botanists; but no author had collected and combined these isolated facts, for the purpose of ascertaining the elevation or depression of country and temperature of climate indicated by these means. Of late years, Wahlenberg, Von Buch, De Candolle, Humboldt, Hornemann, and Schouw have made rapid progress in this department of the science, distributing the vegetables of Lapland, Norway, Sweden, Denmark, Switzerland, the Carpathian Alps, France,

and even of America, Africa, and Asia, in the most comprehensive and masterly manner; yet the Flora of England, though well known and admirably described, has not been subjected to this mode of arrangement. The inaugural Thesis of Dr. Boué, printed at Edinburgh in 1817, is a tract of considerable merit, and serves to throw much light on the general localities of the Scotch plants; and Mr. Brown's Memoir on the Flora of the Southern Hemisphere, published as an appendix to Capt. Flinders's voyage, cannot be too highly praised. The writings of these celebrated authors are mentioned merely with a view of pointing out the strides this branch of science has made within a short period, especially on the continent. The notes now submitted to your consideration are of much humbler pretensions, embracing the limited extent of the three northern English counties, and must, therefore, be considered only as a fragment; but which, it is hoped, may ultimately prove useful to some naturalist, who shall dedicate his time and abilities to this neglected department of British Botany.

England, in the parallel 55° North, which passes the district now under consideration, is scarcely 70 miles broad. Its most elevated mountains, according to Colonel Mudge's survey, are Sca Fell, 3,166 feet in height; Helvellin, 3,053 feet; and Skiddaw, 3,022 feet, among the Grauwacke, Porphyry, and Slate hills of Cumberland: to these succeed Cross Fell, 2,901 feet, in the Encrinal limestone range, which commencing in Northumberland, terminates in Derbyshire, and is sometimes denominated the English Apennines; next

the Syenitic and Greenstone hills of Cheviot, 2,658 feet, and Hegehope, 2,347 feet, situated in the north of Northumberland, and Simonside, some miles to the south of the latter, in the Encrinal limestone district, 1,407 feet; then Pontop Pike, 1,018 feet, on the western border of the Newcastle coal formation: and lastly, Brandon mount, 875 feet, and Warders Law, 632 feet, in the Magnesian limestone, and not far distant from the eastern coast. This tract of country possesses a Flora of 1,037 Phænogamous, and 1,253 Cryptogamic plants, of which between forty and fifty are peculiar to Cumberland.

Among the Phænogamous plants are comprised:—

- 28 Species of Trees, besides 20 Willows,
- *13 Roses,
- 94 Grasses,
- 20 Orchidæ,
- 17 Liliaceous Plants.
- 17 Rough leaved Plants (*Asperifoliæ*).
- 48 Umbelliferous Plants.
- 42 Plants bearing cross-shaped Flowers (*Cruciformæ*).
- 36 Lipped Flowers (*Labiataæ*).
- 17 Masked Flowers (*Personatæ*).
- 94 Bearing Compound Flowers (*Compositæ*).
- 56 Species whose habitats are on the sea coast.
- 86 Alpine Plants, of which 16 are exclusively natives of the Cumberland Mountains.
- 69 Aquatics, natives of fresh water.
- 111 Marine Aquatics.
- 92 British species, chiefly brought amongst ballast.
- 32 Exotics, introduced by the same means.

* Humboldt did not find an indigenous Rose in South America, and only one species in Mexico. For a monograph of the Roses growing in the North of England, see Appendix.

But the following table, which is arranged according to the system of Jussieu, whose method is well adapted to the present purpose, will give a clear idea of the natural families, and shew the number of species belonging to each, contained in the whole Flora:

1st. class, Acotyledones, 10 families, comprising	1,253 species.
2nd. Monocotyledones, 13 families, comprising	249 species.
3rd. Dicotyledones, 51 families, comprising	788 species.
	<hr/>
	74
	<hr/>
	2,294
	<hr/>

FIRST CLASS.

1 Algæ	169	Brought up	1,206
2 Fungi	378	*7 Filices	32
3 Hypoxyla.....	70	*8 Lycopodiaceæ	6
4 Lichenes	315	*9 Rhizospermæ	3
5 Hepaticæ.....	49	*10 Equisetaceæ	6
6 Musci	225		<hr/>
	<hr/>		1,250 species.
	1,206		<hr/>

SECOND CLASS.

1 Nuyades	6	Brought up	210
2 Gramineæ	94	9 Colchicaceæ ...	2
3 Cyperaceæ.....	56	10 Liliaceæ.....	13
4 Typhaceæ	5	11 Iridæe	2
5 Aroidæe	2	12 Orchideæ	20
6 Junceæ	21	13 Hydrocharideæ	2
7 Asparagæe.....	7		<hr/>
8 Alismaceæ	19		249 species
	<hr/>		<hr/>
	210		

* These four families are placed by De Candolle in the 2nd. Class.

THIRD CLASS.

1 Coniferæ	1	Brought up	390
2 Amentaceæ	52	28 Caprifoliaceæ ...	8
3 Urticæ	6	29 Umbellifereæ ...	48
4 Euphrobiaceæ...	7	30 Saxifrageæ	14
5 Aristolochiæ ...	1	31 Crassulaceæ ...	9
6 Thymeleæ	2	32 Portulacææ	3
7 Polygonææ	21	33 Grossulariæ.....	7
8 Chenopodææ ...	24	34 Salicariæ	4
9 Plantaginææ	6	35 Onagrarææ	16
10 Plumbaginææ ...	2	36 Rosaceææ	55
11 Primulacææ	12	37 Leguminosææ ...	47
12 Rhinanthaceæ ...	21	38 Frangulacææ ...	2
13 Jasminææ.....	2	39 Berberideææ	1
14 Pyrenaceææ	4	40 Papaveraceææ ...	16
15 Labiatææ	36	41 Crucifereææ	54
16 Personatææ	16	42 Capparideææ.....	6
17 Solanæææ	7	43 Cariophyllææ ...	40
18 Borraginæææ	17	44 Violacæææ.....	6
19 Convolvulacææ...	4	45 Cisti.....	2
20 Gentianæææ	9	46 Tiliacæææ	1
21 Ericacæææ	14	47 Malvacæææ	4
22 Cucurbitacææ ...	1	48 Geraniæææ	16
23 Campanulacæææ	6	49 Hypericæææ	9
24 Compositæææ	94	50 Aceraæææ	2
25 Dipsacæææ.....	6	51 Ranunculacæææ	28
26 Valerianæææ	5		
27 Rubiacæææ.....	14		
			788 species.
	390		

After taking a general survey of the families of vegetables with which this part of the island is clothed, it may not be amiss to make some cursory remarks on a few of the most valuable and well known species; of these the Oak first claims our attention. In the

sheltered vales of Tyne, Derwent, and Tees, it attains a large size, and may be considered as truly indigenous; for enormous trunks and branches are dug out of all the peat mosses which are not situated at a very considerable elevation above the levels of the rivers; and this phenomenon occurs even among the recesses of the Cheviot mountains, a district which is now destitute of oaks. In Weardale and Teesdale, trees of stunted growth may be traced to the elevation of 1,600 or 1,700 feet above the level of the sea. The river Dall, in Sweden, in lat. $60^{\circ} 30'$ north, and Christiana in Norway, in $59^{\circ} 56'$ appear to be the northern limits of this valuable timber; but the Oaks which I have noticed on the banks of the Gotha, in lat. 58° were of very diminutive size.

The common Elm of the southern counties of England (*Ulmus campestris*) is certainly not indigenous north of the Tees; and, of course, I cannot help suspecting that the Elm mentioned by Von Buch, as growing in the vicinity of Christiana, and by Wahlenberg to the north of the Lake Venner, in Vermland, will prove to be the Wych Elm (*Ulmus montana*), or possibly the smooth leaved Elm (*Ulmus glabra* of Eng. Bot.). Even in sheltered plantations, on the east side of the island, the common Elm does not attain to a considerable size, though in Cumberland it becomes a large tree, and is much cultivated; but the Wych Elm is abundant in every hedge, and, together with the smooth leaved Elm, skirts our moors at the height of 2,000 feet.

The Beech (*Fagus sylvestris*) and Aspen (*Populus tremula*) are truly natives; the former does not climb

the hills to the same height as the Oak, but flourishes beautifully in the vales. Von Buch assigns the river Gotha as the northern boundary of the Beech, and the province of Halland, in Sweden, as that of the Aspen and black Poplar (*Populus nigra*). Lightfoot doubts whether either the white (*Populus alba*) or the black Poplar are natives of Scotland (*see* pp. 616 and 618); nor have I ever seen these trees in a natural wood in the north of England, though the former is remarkable for withstanding the north easterly winds, so highly detrimental to vegetation on the coast of Northumberland and Durham. The Lime (*Tilia europæa*), the Chesnut (*Fagus Castanea*), and the Hornbeam (*Carpinus Betulus*) stand in the same predicament.

Large Holly trees (*Ilex Aquifolium*) are among the chief ornaments of many woods in the county of Durham, as at Ravensworth and Gibside, and in the vicinity of Barnardcastle, also near Alnwick, in Northumberland, and throughout the whole county of Cumberland; as is the Yew (*Taxus baccata*), to the banks of the Allen, of the Irthing at Wardrew, the Derwent in Borrowdale, and to the white calcareous cliffs in the romantic Dene at Castle Eden. On the margins of the Cumberland and Westmoreland lakes, the Birch (*Betula alba*) equals in size and beauty the Birches in Norway and Sweden; but it is not found on the mountains higher than the Sycamore (*Acer Pseudoplatanus*), which in these sub-alpine regions is quite at home, as well as on the mountainous sheep pastures between Kirby-stephen and Sedburgh; it has besides the valuable property of flourishing on the sea coast. On our hills, too, may be seen

the Mountain Ash (*Pyrus aucuparia*); but the White Beam (*Pyrus Aria*) may be traced from the High Force of Tees to the coast, provided the soil rests upon limestone rocks. The Alder (*Alnus glutinosa*) and Marsh Elder (*Viburnum Opulus*) accompany every stream, and the Hazel (*Corylus Avellana*), Black Cherry (*Prunus Cerasus*), Bird Cherry (*Prunus Padus*), the Spindle tree (*Euonymus europæus*), the Raspberry (*Rubus idæus*), the common Elder (*Sambucus nigra*), are found in all the woods from the sea shore to those situated at an elevation of 1,600 feet; but the common Maple (*Acer campestre*) occurs only in the hedges of the flat country which surrounds Darlington, and in the vicinity of Norton.

The Ash (*Fraxinus excelsior*), and White Thorn (*Mespilus Oxyacantha*), as well as the less useful Crab tree (*Pyrus Malus*), and Black Thorn (*Prunus spinosa*) abound through the whole district; but the Bullace tree (*Prunus insititia*) is extremely rare in Northumberland or Durham, though more frequent in hedges near Carlisle; and the Plumb tree (*Prunus domestica*), Pear tree (*Pyrus communis*), red Currant (*Ribes rubrum*), the Barberry (*Berberis vulgaris*) and Gooseberry (*Ribes Grossularia*) though now of frequent occurrence, I suspect were not originally natives of the soil. The five following shrubs are certainly indigenous: the rock Currant, (*Ribes petræum*), acid mountain Currant (*Ribes spicatum*), alpine Currant (*Ribes alpinum*), black Currant (*Ribes nigrum*), and Privet (*Ligustrum vulgare*); but the upright Honey Suckle (*Lonicera Xylosteum*), which stands on the authority of Wallis,

as growing on the rocks at Shewing Shields, should be expunged from our Flora.

On the elevated moors between Blanchland, at the head of the Derwent, and Wolsingham, on the river Wear,* and even on the mountains of Cross Fell, at an elevation of nearly 3000 feet, the roots and trunks of very large Pines (*Pinus sylvestris*) are seen protruding from the black peat moss, being exposed to view by the water of these bogs having drained off and left the peat bare; but this tree is no longer indigenous with us. It may be worthy of remark, that the Scotch Fir does not at this day attain the size of these ancient Pines, though planted in similar moorland situations, even though the young trees be protected, and the plantations situated at a lower level. In favourable situations, as by the Eden at Corby, in Cumberland, some large trees may be noticed; but on moorland soils, where it formerly flourished, it seldom thrives after thirty or forty years of age, and, spreading its roots horizontally, it is very liable to be blown up by violent winds. The Spruce Fir (*Pinus Abies*) appears never to have been a native of this island, though the woods on the continent of Europe, both to the north and south of Britain, abound with it.

In lowland situations it is impossible to ascertain the native from the exotic Willows; having remarked the blue Willow (*Salix cærulea*) in the Highlands of Scotland, I conclude it may be indigenous here; but I apprehend the golden Willow (*Salix vitollina*) has been brought to us from the south of Europe. On the banks

* This is the only spot in Britain where *Gyrophora glabra* of Acharius has been detected in fructification.

of our sub-alpine rivulets is the true locality of *Salix Croweana*, not in the hedges of Norfolk (*see* Eng. Bot.) The Weeping Willow, a native of Syria and Chaldaea, never ripens its wood, and, of course, never flowers, in the north.

The Furze (*Ulex europæus*) when it can no longer exist on open exposed moors, may be still found in sequestered Denes at a height of 2000 feet; and in similar situations the growth of our most common Brambles, *Rubus corylifolius*, *Rubus glandulosus*, and *Rubus fruticosus*, terminates where they are all but Evergreens, and where the fronds of many Ferns survive the severity of our winters.

On the Fyall Alps, in Lapland, 1,400 feet below the line of perpetual snow, Wahlenberg noticed the following shrubs:—*Salix glauca*, *Betula nana*, *Juniperus communis*, *Salix hastata*, *Arbutus alpina*, *Andromeda cærulea*, *Andromeda polifolia*, and *Rubus chamæmorus*; and at 600 feet higher, *Salix lanata*, *Salix myrsinites*, *Azalea procumbens*, *Azalea lapponica*, *Viccinium uliginosum*, and *Empetrum nigrum*. It may not be amiss to compare these plants with those of a similar description found at 2,000 or 3,000 feet elevation in this latitude: *Salix glauca*, *Betula nana*, *Arbutus alpina*, *Salix myrsinites*, *Azalea procumbens*, *Andromeda cærulea*, and *Salix lanata*, do not reach us, though natives of the Scotch Highlands. *Azalea lapponica* and *Salix hastata* are foreign to Britain; but *Juniperus communis* may be traced from the coast to the mountains 1,500 feet in height; and *Andromeda polifolia*, from the borders of Prestwick Carr, a few miles north west of Newcastle,

at an elevation of 250 feet, to the Muckle Moss, near Shewing Shields, at 450 feet, Green Leighton Moss to the Wallington Moors, at 550 or 600, and to the mountains in the vicinity of Keswick, at an elevation of 2,000 feet above the level of the ocean. *Rubus Chamæmorus* flourishes on the Cheviots, on Simonside, on Cronkley Fell, and other moors in Teesdale, together with *Empetrum nigrum* ;* but *Vaccinium uliginosum* does not attain to so great an elevation. In the place of *Arbutus alpina*, we have *Arbutus Uva ursi*, and instead of *Salix lanata*, a few scattered plants of *Salix arenaria*, on the Teesdale hills; and the summit of Skiddaw is covered with *Salix herbacea*, but without its usual attendant, *Salix reticulata*.

There appears something enigmatical in the causes which affect the growth of many exotic shrubs well known in gardens and plantations; for many natives of the north of Asia, Portugal, Japan, and even of South America, resist the severity of our winters much better than many which are indigenous in Italy, the South of France, and Germany. The strongest instances are those of the common Myrtle, Pomegranate, and Oleander, all of which, though European plants, perish at a temperature no way injurious to the *Rhododendron ponticum* of Asia Minor: this, as well as the *Rhododendron maximum* of North America is much more hardy than the Bay, or even than the Portugal Laurel;

* *Vaccinium uliginosum* occurs in Switzerland, in bogs situated at about 1,500 feet above the surface of the sea, and also at a considerable elevation on the Alps of St. Gottard Gemmi, &c. where the inhabitants (*Alpi colæ*) use it for fuel.—*John Hogg, Esq.* MSS.

though it is probable the Pontic Rose-bay may be a native of the lower ridge of Caucasus, and the American species generally grows in subalpine situations. From Pursh we learn, that *Rhododendron maximum*, α , *roseum*, which is the variety common in our gardens, is found near rivulets and lakes, in the mountains from Canada to Carolina; β , *album*, in the shady cedar swamps of New Jersey and Delaware; γ , *purpureum*, near lakes on the highest mountains of Virginia and Carolina. The author of the Flora of North America is inclined to think these three distinct species. *Rhododendron punctatum* is also from the mountains of Carolina, at the head of the Savannah river, and *Rhododendron Catawbiense* is a native of the high mountains of Virginia and Carolina, at the head of the Catawba river. The Lapland, the Kamtschatkan, the two Swiss, and two Siberian Rosebays, are also alpine plants, and the same may be said of the rare species found on the mountains of Ceylon. This may, in some measure, account for these elegant shrubs withstanding our severe and changeable winters, though they will not thrive in the fenny parts of Lincoln or Cambridgeshire, or in Holland.

On the coasts of Greece, Albania, and Dalmatia, I have observed the limestone rocks covered with the Mastic (*Pistacia Lentiscus*) Myrtle, Rosemary, *Laurustinus*, common *Arbutus*, and Juniper. Of these, the first and second will not survive our winters; the third, fourth, and fifth will not perfect their fruit except in favourable situations, and when the season proves uncommonly mild; but the last ascends our mountains to the height of fifteen hundred feet.

● In gardens and well sheltered grounds, the common Laurel of the Levant (*Prunus Laurocerasus*) and Portugal Laurel (*Prunus lusitanica*) flower freely; and, provided the season be mild, ripen their fruit. The Chinese Rose (*Rosa semperflorens*) and the cluster-flowered Quince, of Japan (*Cydonia speciosa*), when protected by a wall, flower throughout open winters; and the latter has perfected its fruit at Wallington, and in similar situations. *Rosa multiflora* of China, *Buddlea globosa* of Chili, *Acuba japonica*, *Camelia japonica*, and *Corchorus japonica*, survive our severest seasons, and thrive very well, but the Bay of Italy (*Laurus nobilis*) flowers only in the southernmost parts of Durham, and the sheltered vales of Cumberland.

On the other hand, the Provence Rose (*Rosa centifolia*) and the officinal Rose (*Rosa gallica*), said to be from the south of France, but, most probably, originally from Asia Minor; the Damask Rose (*Rosa damascena*), from the same country, are to be met with in every garden: nor is the Musk Rose (*Rosa moschata*) of the north of Africa very scarce. The Roses of Siberia, the Alps, and North America, thrive very well, as does the Evergreen Rose (*Rosa sempervirens*) of Italy and Germany, a plant confounded by foreign botanists and British gardeners with the white trailing Dog Rose (*Rosa arvensis*). The double yellow Rose of the Levant (*Rosa sulphurea*) never flowers in the vicinity of Newcastle: and the same may be said of the single yellow Rose (*Rosa lutea*) of the south of Europe, though it flourishes in the neighbourhood of Hexham, 20 miles to the west, at Norton, in the south east of the county of Durham, and in the

vicinity of the Cumberland lakes. The white Rose of the south of Europe (*Rosa alba*) has become naturalized in one spot on the banks of the Tyne.

I shall now briefly notice such exotic trees as succeed best with us in woods and plantations: the hoary-leaved Alder (*Alnus incana*) and the Norway Spruce (*Pinus Abies*), the Norway Maple (*Acer Platanoides*) from the north of Europe, the elliptic-leaved Alder (*Alnus oblongata*), the cluster Pine (*Pinus Pinaster*), the stone Pine (*Pinus Pinea*), the silver Fir (*Pinus Picea*), the Italian Maple (*Acer Opalus*), the evergreen Oak (*Quercus Ilex*), the Turkey Oak (*Quercus Cerris*), with its varieties the Fulham and Lucombe Oaks, the Athenian Poplar (*Populus græca*), and the Lombardy Poplar (*Populus dilatata*) of the south of Europe, the Larch (*Pinus Larix*) of the Alps, the Cedar of Lebanon (*Pinus Cedrus*), the horse Chesnut (*Æsculus Hippocastanum*), the Tartarian Maple (*Acer tartaricum*), the oriental Plane Tree (*Platanus orientalis*), and Siberian Pine (*Pinus Cembra*) from the north and north east of Asia; the notch-leaved Alder (*Alnus serrulata*), the White Ash (*Fraxinus americana*), the poplar-leaved Birch (*Betula populifolia*), the tall Birch (*Betula excelsa*), the black Birch (*Betula nigra*), the paper Birch (*Betula papyracea*), the soft Birch (*Betula lenta*), the Virginian Hornbeam (*Ostrya virginiana*), the white Spruce (*Pinus alba*), the black Spruce (*Pinus nigra*), the Balm of Gilead Fir (*Pinus Balsamea*), the red Larch (*Pinus microcarpa*), the yellow Horse Chesnut (*Æsculus flava*), the pale-flowered Horse Chesnut (*Æsculus parviflora*), the American Elm (*Ulmus americana*), the drooping Elm (*Ulmus pendula*),

the hornbeam-leaved Elm (*Ulmus nemoralis*), the American Lime Tree (*Tilia americana*), the pubescent Lime Tree (*Tilia pubescens*), the scarlet-flowered Maple (*Acer rubrum*), Sir Charles Wager's Maple (*Acer dasycarpum*), the sugar Maple (*Acer saccharinum*), the striped-bark Maple (*Acer striatum*), the mountain Maple (*Acer montanum*), the ash-leaved Maple (*Acer Negundo*), the dyer's Oak (*Quercus tinctoria*), the scarlet Oak (*Quercus coccinea*), the marsh Oak (*Quercus palustris*), the Canadian Poplar (*Populus monilifera*), the Carolina Poplar (*Populus angulata*), the Tacamahac (*Populus balsamifera*), the heart-leaved Poplar (*Populus candicans*), the various-leaved Poplar (*Populus heterophylla*), the black Walnut Tree (*Juglans nigra*), the white Walnut Tree (*Juglans alba*), and bitter Walnut Tree (*Juglans amara*). But the following trees thrive only in the best soils and when well protected: the Weymouth Pine (*Pinus Strobus*), the pitch Pine (*Pinus resinosa*), the frankincense Pine (*Pinus Tæda*), the swamp Pine (*Pinus palustris*), the Hemlock Spruce (*Pinus canadensis*), the red-flowered Horse Chesnut (*Æsculus pavia*), the willow-leaved Oak (*Quercus Phellos*), the black Oak (*Quercus nigra*), the American Plane Tree (*Platanus occidentalis*), and the Tulip Tree (*Liriodendron tulipifera*), natives of North America; the Cretan Maple (*Acer creticum*) from the Levant, and and the Cork Tree (*Quercus Suber*) from the south of Europe.

Seven different species of Fruit Trees ripen their fruit in the southern counties, which seldom do so in this latitude: these are the Vine, the Fig, the Quince, the

Medlar, the Walnut, the Chesnut, and the Mulberry. This may be ascribed, in some measure, to the prevalence of cold easterly winds during the spring months, destroying the blossoms; to the low temperature of our autumns, which prevents the young wood from hardening and maturing the buds enveloping the flowers in embryo, but more especially to the want of a continuance of sufficient heat during the summer, to bring the fruit, which is occasionally formed, to perfection; for all these trees withstand the winter frost tolerably well in sheltered situations. The Vine seldom flowers, and if by chance small grapes are produced, they soon drop off. The Fig is seldom seen out of the hot-house, or against a hot wall, and is otherwise barren, except in the south eastern corner of the county of Durham, and a few favoured spots in Cumberland; and speaking generally the same may be said of the Quince and Medlar, these flower freely, and the latter has ripened its fruit twice in twenty years, at Jesmond, near Newcastle. The Walnut and Chesnut stand in the same predicament; and even the Filbert bears very sparingly. The Mulberry is here a low stunted tree, but in hot summers bears abundance of small fruit, which in part comes to maturity, and is well flavoured.

On traversing the wild and extensive moors of Durham, Cumberland, and the south of Northumberland, an interesting phenomenon presents itself to view in numerous places: here the surface has been cast into equal ridges by the plough, though the land is now covered by heath, and agriculture has formerly flourished in situations so elevated as to preclude the possibility of

obtaining corn crops from them at the present day.—Record and tradition are alike silent respecting the era when, and the people by whom, these districts were subjected to tillage; nor has any probable conjecture been started to throw light on this curious subject. The most considerable elevation above the level of the sea at which wheat is now cultivated, does not exceed a thousand feet. Oats grow at nearly double that height; but in unfavourable years the sheaves may frequently be seen standing among the snow, which not uncommonly covers the tops of the mountains in October, and is never later in falling than the middle of November. The stations of Barley and Rye are between those of the Wheat and Oats; but Bigg, a more hardy grain than either of the former, is no longer cultivated.*

Turnips, but of a small size, and Potatoes, grow at the same height as Oats; and our moors when newly broken up yield a good crop of Rape. On the soil being turned over for the first time, and lime applied, lands of this description produce White Clover (*Trifolium repens*) in abundance, a circumstance in no way satisfactorily accounted for, but which is known to take place in wastes both in Britain and North America (See Pursh's *Flora Americana*, vol. ii. p. 477), and probably in most other temperate

* I was surprised to see Wheat growing at an elevation of at least 4,000 feet above the sea in the valley of Entreves in Piedmont, situated at the southern base of Mont Blanc. On each side of this valley I observed fields of wheat cultivated at the height of about 400 feet upon the mountains which form the valley near the town of Courmayeur, which is, according to Ebel, 3,750 feet above the level of the sea.—*John Hogg, Esq.'s MSS.*

regions. The white or opium Poppy, which is cultivated on a large scale in Flanders, and the Tobacco, which is to be met with as far to the north as Sweden, are here known only as ornaments to the flower garden.

Before dismissing those plants which are immediately subservient to use, a numerous but humble tribe of vegetables claims our attention: these are the Grasses, Sedges, and Rushes of various descriptions. By the analytical table, it appears we have no fewer than 176 species, most of which are common to every part of Europe; for with the exception of aquatic plants, these productions of the temperate zone are more equally disseminated over the surface of the globe than any other description of vegetables. The more delicate of the grasses, not exceeding twenty in number, mixed with some few plants which are able to contend with them for possession of the soil, cover our meadows and pasture fields, while the strong-rooted, harsh-leaved Sedges, Cotton Grasses, Mat Grass, and small Club Rush, scantily clothe the elevated and boggy moors of the Cheviots, where no other herbage is to be seen, and during the summer months afford pasturage to numerous flocks of sheep.—The three common species of Heath—*Calluna vulgaris*, *Erica cinerea*, and *Erica Tetralix*, also give a peculiar character to the moors and fells in the north; these flourish from 100 to 3,000 feet above the level of the sea, but never on a calcareous soil; which circumstance occasions the striking difference between our heaths and the Yorkshire Wolds, but more especially the downs of the more southern counties, where the sub-stratum is chalk.

The Foxglove, a plant, which has acquired considerable celebrity of late years for its medicinal virtues, is abundant in the county of Durham, but becomes scarce to the north of the Tyne, though it may be noticed in the neighbourhood of Rothbury and Roathley, in Northumberland. The Hensbane is common about all our villages, especially near the sea coast; but the Deadly Night Shade (*Atropa Bella-Donna*) is fortunately very rare.

The plants, which seem designed by nature to bind the loose sands of the sea shore in the north of Europe by their creeping roots, or rather stolones, are the means of forming low round-topped hills called Links, along a considerable part of these coasts. Those whose localities are confined to the beach are the Sea Wheat Grass (*Triticum junceum*), Sea Mat Grass (*Arundo arenaria*), Sand Lime Grass (*Elymus arenarius*), Sea-green Fescue Grass (*Festuca glauca*), Sand Sedge (*Carex arenaria*), and occasionally Sea Eryngo (*Eryngium maritimum*), and Sea Rush (*Juncus maritimus*); but to them may be added the following auxiliaries, which are by no means exclusively the productions of the sea shore—the Couch Grass (*Triticum repens*), the Ladies' Bed Straw (*Galium verum*), the Rest Harrow (*Ononis repens*), the Burnet-leaved or Scotch Rose (*Rosa spinosissima*), with some Compositæ and a few other plants. The Sea Buckthorn (*Hippophae rhamnoides*) is unknown here, nor are the upright Cocksfoot Grass (*Dactylis stricta*), Creeping Panic Grass (*Panicum Dactylon*), or Great Sharp Sea Rush (*Juncus acutus*), all of which occasionally occur on the southern coast of England, and abound on the shores

of the Mediterranean, to be met with; and the rare northern Sedge (*Carex incurva*) is also a stranger.

Of the domestic plants, or such as follow the footsteps of man, and thrive amidst dust and rubbish, we have such as are common to the rest of Britain. The Wormwood, Mallow, Mugwort, Hemlock, Docks, &c. &c. are to be found wherever a few miserable hovels are built, and the Plantain (*Plantago major*) by every foot-path. Ramond and De Candolle observed several of these species among the ruins of cottages where shepherds had once lived, high on the Pyrenees; and some years since I remarked the same circumstance in the Highlands of Scotland. The constant appearance of these weeds about towns and villages is a curious and inexplicable phenomenon, for no one ever cultivated such plants for utility, much less for ornament.* And here it may not be amiss to notice some flowers which

* The appearance of domestic plants, as thriving about the poorest habitations, struck me in my passage over the Col du Bon Homme, a mountain in Savoy, whose extreme height is 8,376 feet above the sea. Having descended about half the way from the summit, called La Croix du Bon Homme, 7,530 feet, to the village of Chapiu, 4,668 feet, I passed a few old wooden sheds which had been erected for cows, about these I saw several common plants, docks, &c., and among which was the Alpine Dock (*Rumex alpinus*). I also remarked the occurrence of the same species in the small and wretched villages of Chapiu and of the Glacier; likewise at the Chalet of Motet, situated on the Col de la Seigne, a mountain 7,578 feet above the surface of the sea in height. In addition to these common species, *Cineraria cordifolia*, called Goldkraut by the Bernois, grows about the chalets on all the alps.—*John Hogg, Esq.'s MSS.*

are now indigenous, and have been admitted to a place in the *Flora Britannica* by Sir E. Smith, but which at no very distant period have escaped from the garden. We have three remarkable species standing in this predicament—the Summer Snow Flake, the single yellow Tulip, and the drooping Star of Bethlem; besides the Snowdrop, Daffodil, Bitter Candytuft, Celadine, Willow leaved *Spiræa*,* and Scentless Dame's Violet, are seldom found far from some habitation. On the other hand, the Columbine is truly a native of our woods, and the borders of the Cumberland Lakes; and the Rosebay Willow herb, (which being overlooked in the time of Ray, has had its right to a place among British species disputed) is found on our most inaccessible rocks, and among the recesses of the Cheviots, in Teesdale, and at Shewing Shields.

The Fuller's Teasel (*Dipsacus fullonum*), and Woad (*Isatis tinctoria*) appear to have been introduced by the means of cultivation; though if it could be ascertained that a preparation of the latter was really the substance used by the Britons to stain themselves blue, the Woad would have a good right to be considered indigenous. The Hop occurs in hedges, but never in natural woods, and probably was originally a stranger.

As the temperature of the waters varies much less than that of the atmosphere, aquatic plants are more universally spread over the surface of the globe than any other description of plants. Of 65 species which

* The Willow-leaved *Spiræa* was planted in the woods at Gib-side, Durham, as an ornamental shrub. See Smith's *Eng. Bot.* vol. ii, p. 369.

we have, 62 are common to the rest of this island; and the three individuals, *Alisma natans*, *Isoetes lacustris*, and *Lobelia Dortmanna*, which may be considered rare, are natives of the colder waters of the Cumberland Lakes.

The vegetables, which are to be met with every where in our plains, we have in common with the North of France, Switzerland, and Germany, and even in Norway the pasture grasses are like our own; and our Alpine productions agree in a great measure with those of the mountains of Switzerland, Piedmont, Savoy, and Lapland: but the following enumeration will place this similarity in a clear point of view. I shall notice—

1st. Those Plants which have reached their Northern Limits in this part of the kingdom.

2nd. Such as have reached their Southern Limits.

3rd. Those that are found on the Sea Coasts, and again on the Mountains.

4th. Rare Species, natives of Switzerland,

5th. _____ of Lapland,

6th. _____ of both these Countries.

7th. _____ of neither of these Countries.

8th. Oleraceous Plants found in a natural state,

9th. Plants which have become naturalized, though originally cultivated or imported with ballast.

10th. Exotics introduced by the same means.

1. *Plants which have reached their Northern Limits.**

Cladium Mariscus. At Hell Kettles, near Darlington.

Gentiana Pneumonanthe. In a field between Maryport and Flimby, near the latter place.

Bupleurum tenuissimum. On Seaton Moor, near the mouth of the Tees.

Bupleurum rotundifolium. In corn fields to the north of Norton, Durham.

Statice Limonium. Occurs sparingly on the muddy shores by the mouth of the Tees; by the Wear, above Hilton; and on Basaltic rocks, called St. Cuthbert's Island, at Holy Island, in Northumberland; but does not reach the East Coast of Scotland, though it is found on the Mull of Galloway on the West Coast.

Convallaria Polygonatum. On rocks at Kylloe, a few miles south of Berwick upon Tweed. (*See* Smith's Eng. Fl. vol. ii. p. 155.)

Juncus maritimus. On the Sea Shore, near Seaton.

Butomus umbellatus. (*See* Lightfoot's Flora Scotica, vol. ii. p. 1,139.) In the river Skerne, near Darlington, and in rivulets near Norton.

Delphinium Consolida. In fields near the Lough, on Holy Island.

Taxus baccata. On rocks in Castle Eden Dene, and near the Graphite mine in Borrowdale; and I doubt if it be indigenous further north.

On the Magnesian Limestone, which skirts the coast of Durham, are found—

Hedysarum Onobrychis (Saintfoin). Grows wild on Harton-down

* In the first edition of this pamphlet, published in 1819, *Rumex aquaticus* was mentioned as having reached its northern limits near Preston upon Skern, and at Polam, near Darlington; *Hippocrepis cernua* on Cronkley Fell, and *Carex extensa* in a marsh above Southwick, on the Wear, at Seaton, and near Waskerley, west of Wolsingham; but since that period these plants have been added to the Flora of Scotland.—*See Hooker's Flora Scotica*, pp. 112, 216, 267; and *Greville's Flora Edinensis*, p. 195.

Hill, and about Ryhope. A hint the farmers of that neighbourhood do not benefit by, though they cultivate a sterile calcareous soil.

Epipactis ensifolia and *Ophrys muscifera*. In the deep and romantic Dene at Castle Eden; and in Hawthorn Dene, situated about a mile north of Easington.

Cypripedium Calceolus. In Castle Eden Dene.

Ophrys apifera. Reaches a little further north to the vicinity of Ryhope and Monkwearmouth.

Tamus communis. Terminates its long range on the north bank of the river Wear, above Sunderland, from as far south as Algiers.—(See Sir J. E. Smith's Remarks in the English Botany).

2. Plants which have reached their southern Limits.

Aira alpina. By the Wear, near Low Pallion.

Festuca calamaria β *decidua*. By Haws Water.—*Eng. Bot.*

Sagina maritima. On Hartlepool Pier and Seaton Moor.

Gentiana verna. In Teesdale Forest.

Ligusticum scoticum. Among the stones on the beach, at the north side of Dunstanborough Castle, also near Balmberough Castle, Northumberland.

Juncus castaneus. On the Teesdale Moors.—*Rev. John Harri- man, in Smith's Eng. Fl. vol. ii. p. 174.*

Cerastium tetrandrum. On the Links, near South Shields and Wearmouth.

Potentilla fruticosa. In Teesdale, and in the Devil's Sledge Gate in Wastdale Screes.

Nuphar minima. In Chartner's Lough, on the Wallington Moors, at an elevation of between 5 and 600 feet. This plant differs in nothing, except being smaller in size, from *Nuphar lutea*, the flower scarcely measuring an inch across, when expanded, for the specific marks of the stigma being toothed or entire, is fallaceous, and depends upon the age of the seed-vessels of these plants. But it may be worthy of notice that *Nuphar minima* was transplanted fifteen years since by John Trevelyan, Esq. into his fish ponds at Wallington, where it grows with *Nuphar lutea*, and still retains its diminutive size.

Linnaea borealis. In a Fir plantation at Catcherside, about four miles west of Wallington, growing with *Pyrola minor* and *Trientalis europæa*. First discovered by Miss Emma Trevelyan.

Carex pauciflora. Near Shewing Shields, in marshy ground south of the Roman wall, at 500 feet, the only English habitat.

3. *Plants which grow near the Sea Coast, and are also found on the Mountains:—*

Statice Armeria, *Juncus cœnosus*,* *Cochlearia officinalis*, do not occur in the intermediate country between the coast and the mountains; but are to be met with on Teesdale and Weardale Moors, at a height of 1,500 or 2,000 feet above the level of the sea.

Plantago maritima. On the sea coast; also on Newcastle Town Moor, at Bavington, and at the High Force of Tees.

Hippocrepis comosa. On Cronkley Fell, at an elevation of above 1,500 feet.

Carex extensa. In a marsh above Southwick, and at Seaton; also near Waskerley, west of Wolsingham, from the coast to 1,000 feet.

The following Species may be traced all the way from the coast to the height of 1,200 feet or upwards:

<i>Veronica serpyllifolia</i> .	<i>Rubus corylifolius</i> .
<i>Galium verum</i> .	<i>Rubus idæus</i> .
<i>Myosurus palustris</i> .	<i>Rubus saxatilis</i> . From Castle
<i>Campanula latifolia</i> .	Eden Dene to the High Force
<i>Erythræa Centaureum</i> .	of Tees, but not common.
<i>Parnassia palustris</i> .	<i>Geum rivale</i> .
<i>Pyrola minor</i> .	<i>Aquilegia vulgaris</i> . In Heaton,
<i>Chrysosplenium alternifolium</i> .	Castle Eden, and Hazleden
<i>Rosa spinosissima</i> .	Denes; at Allansford, Baydales,
<i>Rubus cæsius</i> .	and near Middleton in Teesdale;
<i>Rubus fruticosus</i> .	at the foot of Derwentwater, on
<i>Rubus glandulosus</i> .	Ramps Holm, an Island in the

* This Plant strongly resembles *Juncus botanicus* of Wahlenberg.

Lake, and at the head of	<i>Ophioglossum vulgatum</i> .
Wastwater.	<i>Botrychium Lunaria</i> .
<i>Trollius europæus</i> .	<i>Cyathea fragilis</i> .
<i>Geranium sylvaticum</i> .	With most of the Grasses and
<i>Fumaria claviculata</i> .	Cariacs.
<i>Vicia sylvatica</i> .*	And also,
<i>Ornithopus perpusillus</i> .	<i>Sesleria cœrulea</i> ,
<i>Hieracium murorum</i> .	<i>Primula farinosa</i> ,
<i>Solidago Virgaurea</i> .	<i>Gentiana Amarella</i> ,
<i>Orchis mascula</i> .	provided the soil be calcareous.
<i>Orchis Morio</i> .	

4. *Rare Plants—Natives of Switzerland* :—

Utricularia vulgaris. At Hell Kettles, Polam, and Prestwick Carr, and in the Lake at Hardwick, near Sedgfield.

Melica nutans. In Woods at no great elevation above the level of the sea, but rare, as Cocken, Castle Eden, and Teckett.

Jasione montana. Near Hamsterley, Witton-le-Wear, Gilsland, Haltwhistle, Keswick, Calder Bridge, and in Patterdale.

Cuscuta Epithymum. In clover fields half a mile west of Stanton—its only station in the district.—*John Hogg, Esq.*

Gentiana verna. On Teesdale Forest, particularly near Wheysike House and Widdy Bank.

Meum athamanticum. Near Keswick, Cumberland, and Thockerington, Northumberland.

Imperatoria Ostruthium. At Newbiggen, near Middleton, and in Teesdale Forest; also on the banks of Dardree Burn, between Dardree Shields, and the Wear.

Allium arenarium. In Castle Eden Dene, and by the Tyne, at Low Elswick.

* Scott, who appears to have noticed the Wood Vetch in the thickets about Rokeby, thus beautifully describes this elegant climber :—

And where profuse the Wood Vetch clings
Round Ash and Elm in verdant rings,
Its pale and azure-pencilled flower
Should canopy Titania's bower.

Colchicum autumnale. Near Darlington, Egleston, and Butterby, Durham.

Convallaria majalis. In Scotswood, Denton, and Castle Eden
Denes, in Gibside Woods, and near Winch Bridge, Teesdale; also
near Warden Mill.

Ornithogalum luteum. By the Tees at Wycliffe, Barnard-Castle, and Egleston, and the Wear at Butterby.

Juncus subverticillatus—Bicheno. By the Lakes of Cumberland and Westmorland.

Epilobium alsinifolium. On Cheviot and Cronkley Fell, and on the highest ridge of Foalfoot, at the head of Longsledale. It is the *Epilobium alpinum* of Ray and Curtis.

***Pyrola rotundifolia.* In Castle Eden and Hawthorn Denes.**

Pyrolia media. In Scotswood, and East Common Wood, and by Roadley Lake, Northumberland. In Hounswood, and Blackstone Bank Wood, Durham, from 100 to 1,000 feet.

Pyrola minor. In Gibside Woods, and on Teesdale Forest, at Cocken, in Arngill, Cow Close, and Hindon Gills, and in Skullwood, near South Hamsterley, Durham. In East Common Wood, at Catcherside and Wallington, Northumberland.

Saxifraga hypnoides. On rocks at Falconclint Scar, below Cauldron Snout, Teesdale,

Dianthus deltoides. Near Wooler, Belford, and Alnwick.

Stellaria nemorum. In woods, though not very common.

Arenaria verna. On the Weardale and Teesdale Moors, particularly on old lead mine rubbish, from 1,000 to 2,000 feet.

Sedum Telephium. On Rocks and Walls near the Cumberland Lakes, particularly in the vicinity of Keswick.

Sedum villosum. Near Rothbury, at 600 feet, at Bavington, Alston, and on the Weardale and Teesdale Moors.

Rosa dumetorum. In Heaton Dene, and hedges near Newcastle.

Rubus glandulosus. About Newcastle.

Potentilla fruticosa. On basaltic rocks near Winch bridge, in Teesdale.

Cistus marifolius. On Cronkley Fell, at 2,000 feet.

Thalictrum minus. On the coast of Northumberland and Durham.

Thalictrum majus. From Darlington to the Teesdale Moors, and in the Woods at Nunnery, Cumberland.

Adonis autumnalis. In fields near Norton, Durham.—*J. Hogg, Esq.*

Mentha rotundifolia. In Borrowdale, near Lowdore.

Lathraea squamaria. In Lumley, Egleston, Shipley and Cocken Woods.

Thlaspi alpestre. On the Moors in Teesdale, Weardale, and Alendale.

Lepidium latifolium. At Tynemouth Castle, Durham Abbey, and near Seaton; also in the Quarry at Hartlepool.

Geranium lucidum. Near Hexham, and in Teesdale; also near the Lakes of Cumberland.

Geranium sanguineum. On the sea coasts of Northumberland, Durham, and Cumberland.

Fumaria claviculata. From the neighbourhood of Newcastle to Egleston. This pretty plant frequently covers the roofs of cottages in the Highlands of Scotland.

Lathyrus sylvestris. On Rocks, by the Red Neese, near Whitehaven.

Astragalus hypoglottis. On the sea coast of Durham and Northumberland, and on Ratcheugh Crag, near Alnwick.

Hypericum montanum. In Castle Eden and Ryhope Denes.

Anthemis tinctoria. By the road side near St. Anthon's. On a bank near the river Tees, not far from Sogburn. *Ray's Syn.* 3^{ed.} p. 183.

Orchis albida. At Shewing Shields, by Roadley Lake and by Fallowlee's Burn, Northumberland; near Winch Bridge in Teesdale, Durham; and in Borrowdale, Cumberland, from 500 to 1,000 feet.

Impatiens Noli-me-tangere. At Scale Hill, Cumberland; also on the shores of Windermere, and near Ryedale, Westmoreland.

Epipactis Nidus-avis. In Castle Eden and Cocken Woods; also in Williamswick Dene, and near Wardrew.

Malaxis paludosa. On Egleston Moors.

Kobresia caricina, of Willdenow (*Schœnus monoicus* of Eng. Bot.). On Teesdale Forest, and Cronkley Fell, 1,500 to 2,000 feet.

Viscum album. On trees near Bedlington, Northumberland.—The only habitat in the district.

Lycopodium inundatum. In Borrowdale.

Osmunda regalis. By the Cumberland Lakes.

Asplenium Bryenii. At Fast Castle, Berwickshire.—*Dickson*.

Asplenium Adiantum nigrum. On Newcastle Town Walls, on Rocks at Cocken, and at the High Force of Tees, from 200 to 1,500 feet.

Scolopendrium Ceterach. On Troutbeck Bridge.

Splachnum ampullaceum. At Prestwick Carr, Northumberland, and on the Durham Moors.

Trichostomum microcarpon. On Cheviot.

Leskia polyantha. *Greville Crypt. t.* 151. In woods, near Darlington.

Hypnum flagellare. On dripping Rocks in the upper part of Westcrow Dene, west of Wolsingham.

H. recognitum, *Eng. Bot.* In woods near Darlington, and at Cocken.

H. pulchellum. In Newton Cap Wood, near Bishop Auckland.

H. salebrosum. In woods near Newcastle—rare.

Parmelia perforata. About Keswick, abundant.

5. *Rare Plants—Natives of Lapland:—*

Utricularia intermedia. *Eng. Bot.* *U. vulgaris* β , Linnæus. In Prestwick Carr, and in Derwentwater.

Cornus suecica. On Cheviot —*Dr. Penny*.

Lithospermum maritimum. On the beach near Whitehaven.

Lobelia Dortmanna. In the Cumberland and Westmoreland Lakes.

Tofeldia palustris.* On Cronkley Fell near the Black Ark.

Butomus umbellatus. In the Skerne, near Darlington, and in rivulets near Norton.

Rubus Chamæmorus. On Cheviot, Simonside, above Knarsdale and Coanwood, on Cronkley Fell, on the Teesdale and Allendale Moors, from 1,000 to 3,000 feet.

* Sir J. E. Smith has separated the Swiss species of *Tofeldia* from that of Lapland, and named it *Tofeldia alpina*. — *Linn. Trans. v. vii, p.* 239.

Thalictrum alpinum. On Cronkley Fell, in Teesdale.

Sagittaria Sagittifolia. In ponds near Norton, Whitton, Portwrack, Thorp, and Stockton.

Salix rosmarinifolia. On the banks of Derwent, near Fryarside, Durham.

Myrica Gale. Moors near Harbottle, by Roadley Lake, and by the Cumberland Lakes.

Isoetes lacustris. In the Cumberland Lakes.

Rhodiola rosea. At Helbeck, Westmoreland.

Lecidea microphylla. On stones near Egleston—rare. *Rev. John Harriman*.

Cornicularia tristis. On rocks above Blackton, near Egleston, also near Middleton, and on Cronkley Fell.

6. *Rare Plants—Natives both of Lapland and Switzerland :—*

Circæa alpina. Below Castlehead Wood near Keswick, and in Ashness Gill.

Festuca vivipara. In Borrowdale and Teesdale.

Galium boreale. Begins to make its appearance at Croft Bridge on the Tees, and is abundant in Teesdale, Weardale, and on Tyne.

Alchemilla alpina. In Borrowdale.

Ribes alpinum. In Cliff Wood, near Darlington, and hedges near Murton House, Durham.

Ribes petraeum. *Ribes rubrum* β , Wahl. Fl. Lap. p. 56. In Scotswood and Ravensworth Woods, near Egleston, and on Teesdale Forest, also near the Vicarage, at Keswick.

Viola lutea. On the high moors of Durham, Northumberland, and Cumberland, also in Ennerdale.

Scandix odorata. On the banks of most of the subalpine streams in Durham.

Drosera rotundifolia, *Drosera anglica*, and *Drosera longifolia*. On boggy moors.

Narthecium ossifragum. On high boggy moors.

Juncus triglumis. On Meldon Fell, on Helvelling, and by Scales Tarn on Saddleback, at 2,500 feet.

Juncus filiformis. By Derwentwater.

Luzula congesta. *Juncus campestris* β Fl. Brit. vol. i, p. 386.

On wet moors and commons.

Luzula spicata. On Fairfield.

Rumex aquaticus. Near Preston on Skern, and at Polam.

Oxyria reniformis. In Ashness Gill, near Keswick.

Trientalis europæa. On moors at Harbottle, Rothbury, Green Leighton, and south of Haltwhistle; at Catcherside, four miles west of Wallington; by Roadley Lake, and near the summit of Simon-side, Northumberland; on Waskerley Moors, Durham, from 500 to 1,500 feet.

Epilobium angustifolium. At the foot of Cheviot, on the Basaltic Rocks at Shewing Shields, and by the Tees, above Middleton.

Vaccinium uliginosum. Near Middleton, and on Meldon Fell, also on the north side of Walltown Crags, and near Wardrew, from 500 to 2,000 feet.

Polygonum viviparum. On high pastures and moors in Teesdale and Allendale.

Paris quadrifolia. In woods, but not frequent.

Andromeda polifolia. On the banks of Prestwick Carr, and on the Muckle Moss, near Shewing Shields; near Green Leighton, and on the Wallington Moors, also on the mountains in the vicinity of Keswick. The figure of *Andromeda polifolia* in English Botany, t. 713, must have been drawn from a specimen of the variety γ *angustifolia* of Willdenow's *Species Plantarum*, which is a native of Labrador. The British plant is his variety β *media*.

Arbutus Uva-ursi. In East Common Wood near Hexham, on Cronkley Fell, and near Blanchland, from 300 to 2,000 feet.

Pyrola secunda. In Ashness Gill, between Keswick and Lowdore, probably the only English locality.

Saxifraga stellaris. On Cheviot, on the Teesdale Moors, and on the Mountains, and by the borders of the Lakes of Cumberland and Westmoreland, from 200 to 2,000 feet.

Saxifraga Hirculus. At the junction of the Black Beck with the Balder, Teesdale—abundant.

Saxifraga aizoides. By the Lakes of Cumberland, on rocks by the river Irthing at Gilsland, and in Teesdale Forest.

*Silena acaulis** Dove Crag, on Fairfield.

Cerastium alpinum. On Helvelling.

Dryas octopetala. On the summit of Cronkley Fell.

Ranunculus Flammula δ reptans. By the Lakes of Cumberland and Westmoreland.

Caltha palustris β radicans. On Helvelling, and by the shores of most of the Lakes in Cumberland and Westmoreland.

Bartsia alpina. By rivulets on Teesdale Forest.

Melampyrum sylvaticum. Near Keswick, and at Egleston, and Winch Bridge in Teesdale.

Draba incana. On limestone rocks north of Middleton, and on Cronkley Fell.

Serratula alpina. On Helvelling, Cumberland.

Ophrys cordata. On Egleston Moors, and at the head of the river Derwent, Durham; also by Roadley Lake and Darden Lough, Northumberland.

Carex capillaris. On Teesdale Forest, at 1,500 feet.

Salix pentandra. Near Gilsland, Shewing Shields, and in Teesdale, also by the Lakes of Cumberland and Westmoreland.

Salix phylicifolia. At Prestwick Carr, Northumberland, and on the Derwent, Durham.

Salix herbacea. On Skiddaw, at the height of 3,000 feet.

Salix arenaria. On Teesdale Moors—rare.

Equisetum hyemale. In every wood.

Aspidium Lonchitis. On Cronkley Fell.

Asplenium viride. In Ashness Gill near Keswick, and on Cronkley Fell Teesdale, and at Wardrew and Whinnetly.

Woodsia boreale. On basaltic rocks near Cauldron Snout, Teesdale, at 2,000 feet.

Sphlacnum sphærecum. At Prestwick Carr, at Catcherside, and on Holliwell Moss, Northumberland, from 200 to 1,500 feet.

* *Silena acaulis* is abundant on all the Alps of Switzerland, from 7,000 to 8,000 feet above the level of the sea. This was the last phænogamous plant which M. de Saussure observed when he made his celebrated ascent to the summit of Mont Blanc, the 3d of August, 1787. He found a tuft of it in full bloom, on the rock near which he lay, at his return, about 1,580 French toises above the level of the Mediterranean.—*John Hogg, Esq.'s MSS.*

Lecidea cervina, *Ach. Syn. p.* 188. Lichen squamulosus, *Eng. Bot. t.* 2,011. On stones near Egleston, and Muggleswick Fell.

Gyrophora pustulata. On the Millstone Grit at Shaftoe Crag, near Wallington, Northumberland.—*Miss Emma Trevelyan*. Near Irton Hall, Cumberland.

Lecanora muscorum, *Ach. Syn. p.* 193. Lichen carnosus, *Eng. Bot. t.* 1,684. In Hag Crag Wood, and on Teesdale Forest, Durham. Near St. John's chapel, in the neighbourhood of Keswick.—*Rev. J. Harriman*.

7. *Rare Plants—which are not Natives of Lapland or Switzerland:—*

Schoenus rufus. By the Wear below Southwick, and at Hartlepool.

Galium Witheringii. At the foot of Castlehead Wood near Keswick, and near Rose Castle, Cumberland.

Sagina maritima. At Hartlepool and Seaton, Durham.

Erythraea littoralis. On the Links at Bambrough and Holy Island.

Linum perenne. At Baydales, and near Marsden Hall.

Alisma natans. In Derwent-water.—*Dickson*.

Juncus castaneus. Teesdale Moors.—*Rev. John Harriman, in Sm. Eng. Fl. v. ii. p.* 174.

Saxifraga hypnoides β *platypelata*. On the west side of Helvellin.

Sedum anglicum. On walls and rocks near Ryedale, and at the Strands in Wastdale. This is also a Norwegian plant.

Rosa gracilis. Between Keswick and Lorton, Cumberland; and at Baydales, Durham. Var. β *flore albo*. In Ennerdale, Cumberland.

Rosa rubella. On the Durham coast.

Potentilla fruticosa. By the Tees, from Barnard Castle, to the High Force; also in the Devil's Sledge Gate, in Wastdale Scree. This is a native of Celand, according to Willdenow; and of Canada, on the authority of Pursh.

Papaver cambricum. Near Windermere.

Sisymbrium monense. Near Maryport and Allonby.

Sisymbrium Irio. On the fortifications of Berwick.

Carex rigida. On the summit of Cheviot, on the Teesdale

Mountains, and on Skiddaw. This is *Carex caespitosa* β of Hooker's *Fl. Scot.* p. 268.

Salix Croweana, Fœm. At Blanchland, and in Teesdale, at 1,000 feet and upwards. Mas. At Cambo, Northumberland.

Salix amygdalina. On the rivers Team, Derwent, Irthing, and North Tyne.

Salix rupestris. Near Blanchland.

Salix Andersoniana, Mas. In Heaton Dene, near Newcastle.

Salix Forsteriana, Fœm. In Heaton Dene, and on the banks of the Tyne, near Friar's Goose.

Asplenium marinum. On rocks at Whitburn and Seaton, Durham.

Cyathea dentata? On rocks at Windy Bank and Caldron Snout.

Hymenophyllum Tunbridgense. On rocks and trees at Lowdore, and on Simonside Hills, Northumberland, at the height of 1,350 feet.

Trichostomum ellipticum. On Skiddaw.

Orthotrichum pulchellum. On trees in Cawsey Wood.

Daltonia heteromalla. Subalpine woods in Durham and near Keswick. This is a native of Germany.

Hypnum polymorphum. In fields, near Medomsley. Also a German plant.

Bartramia arcuata. On alpine moors, and in the recesses of the Cumberland mountains, where it bears fruit abundantly.

Jungermannia hevigata. On stone walls between Keswick and Barrow.—*Mrs. Winch*.

Lecidea pholidiota, *Ach. Syn.* p. 53. *Lichen glebulosus*, *Eng. Bot. t.* 1955. On rocks at Nitsley, and walls at Lanchester, Durham.

Verrucaria Harrimanni, *Ach. Syn.* p. 93. On limestone rocks on the Teesdale Moors.

Thelotrema exanthematicum. On limestone rocks near the new bridge at Barnard Castle. A native of the south of Europe.

Pyrenula umbonata, *Ach. Syn.* p. 121. *Parmelia thelostoma*, *Eng. Bot. t.* 2, 153. On basalt near Egleston.—*Rev. John Harriman*.

Urceolaria diacapsis, *Ach. Syn.* p. 142. *Eng. Bot. t.* 1, 954. On stones between Barnard Castle and Barley Banks.—*Do.* Also a native of Spain.

Collema spongiosum. On earth upon Eggleston and Middleton Moors, and near the smelt mill in Harewood.—*Do*.

Collema Burgessii. On trees at Lowdore. Also a native of Denmark.

Leageum Trevelyani, *Greville's Cryptogamic Flora*, t. 132.—Upon *Dicranium bryoides*, in Wallington Woods.—*W. C. Trevelyan, Esq.*

8. *Oleraceous Plants found in a Natural State :—*

Daucus Carota. On the sea coast.

Smyrnium Olusatrum. About Tynemouth, Dunstanborough, and other old Castles, also on Newcastle Town Walls.

Pastinaca sativa. On the Magnesian limestone.

Apium graveolens. On rocks by the sea coast, and in salt marshes.

Allium Schoenoprasum. On the basaltic rocks at Walltown, Northumberland.

Cochlearia officinalis. On rocks and in salt marshes near the sea coast, also on the Weardale and Teesdale Moors.

Cochlearia Armoracia. By slow streams—rare. About Alnwick and elsewhere in Northumberland, in ditches and by water sides.—*Ray's Syn. 3d. ed. p. 301.*

Brassica oleracea. On rocks at Tynemouth Castle and near Wearmouth.

9. *Plants not originally Indigenous, but which have become Naturalized :—*

Menyanthes nymphæoides. In ponds at Wallington. A native of the south of England.

Lonicera Xylosteum. In hedges south of Alnwick, and in the Cocken Woods.

Daphne Mezereum. Among the Tunstall Hills, south of Sunderland.

Saxifraga umbrosa. On stone walls behind Ormathwaite, Cumberland. This elegant plant, so common in our gardens, does not appear

to be a native of either Switzerland or Lapland, and its Scotch and English localities are very dubious—of Ireland it is certainly a native.

Asarum europæum. Waste ground about Ormathwaite. Introduced as an official plant.

Rosa Eglanteria. In hedges, but rare.

Rosa alba. On the banks of Tyne, below Bill Quay. A native of Germany.

Spiræa salicifolia. In Gibside Woods, also in the woods at Wallington, and by Roadley Lake. Introduced as an ornamental shrub in these three localities.—*See Smith's Eng. Fl. v. 2, p. 369*. A native of the north east of Europe and Siberia.

Stratiotes aloides. In ponds north of Cambo, Northumberland.

Aster fragilis. On an island at the junction of North and South Tyne, near Hexham. From North America.

Introduced with ballast :—

Anchusa officinalis. On the Links at Hartley. Possibly from Germany.

Borrago officinalis. From the Levant.

Echium italicum. From Italy.

Datura Stramonium. Said to have come originally from Abyssinia.

Eryngium campestre. On the shores of Tyne, where it has flourished for upwards of a century. Probably introduced from Holland.

Coriandrum sativum and *Scandix Cerefolium*. From the south of Europe.

Linum usitatissimum. Originally from Egypt.

Oenothera biennis. From North America.

Papaver somniferum. From the Levant.

Sisymbrium murale. Originally from France.

Erigeron canadense. From North America.

Centaurea Jacea. Probably from France.

Glaucum lauteum and *Geranium pyrenaicum*. From Scotland.

Phalaris canariensis, *Panicum verticillatum*, *Panicum viride*, *Panicum sanguinale*, *Polypogon monspeliensis*, *Cynosurus echinatus*, *Bromus diandrus*, *Anagallis cærulea*, *Solanum nigrum*, *Anethum Fœniculum*, *Clematis Vitalba*, *Ranunculus hirsutus*, *Teucrium Chamædrys*,

Geranium rotundifolium, *Anthemis maritima*, *Centaurea Calcitrapa*, and *Hydrocharis Morsus-ranæ*. From the south of England.

Introduced with corn :—

Agrostis Spica-venti, *Bromus secalinus*, *Avena fatua*, *Lolium temulentum*, *Lolium arvense*, *Agrostemma Githago*, *Euphorbia platyphylla* β *stricta*, *E. Lathyris*, *Papaver hybridum*, *Papaver Argemone*, *Papaver dubium*, *Papaver Rhœas*, *Delphinium consolida*, *Adonis autumnalis*, *Iberis amara*, *Myagrum sativum*, *Chrysanthemum segetum*, and *Centaurea Cyanus*. From the south of England.

10. *Exotics found chiefly on the Ballast Hills of Tyne and Wear* :—

Phalaris paradoxa, *Convolvulus tricolor*, and *Hyoscyamus albus*. From the south of Europe.

Hyoscyamus aureus. The Levant.

Solanum Lycospermum. South America.

Cuminum Cyminum. Egypt.

Apium Petroselinum. Sardinia.

Reseda odorata. Egypt.

Argemone mexicana. Mexico.

Nigella arvensis. Germany.

Nigella Damascena and *Ranunculus muricatus*. South of Europe.

Alyssum incanum. North of Europe.

Lepidium sativum and *Lavatera trimestris*. South of Europe.

Pisum Ochrus. Italy.

Ornithopus compressus. Portugal.

Scorpiurus vermicularis. South of Europe.

Vicia Benghalensis. India. I have also specimens from the Gulph of Glaucus.

Vicia cordifolia. Probably from France.

Trifolium indicum. India.

Trifolium messinensis. Sicily.

Trifolium elegans. From France.

Medicago coronata and *Medicago rigidula*. From the south of Europe.

Medicago prostrata. Italy.

Scolymus maculatus. South of Europe,

Anthemis mixta. France.

Anthemis Valentina, *A. tomentosa*, *Centaurea Galactites*, and
Calendula officinalis. South of Europe.

Cannabis sativa. Originally from India.

Atriplex hortensis. Originally from Tartary.

By the foregoing data it will appear that this small portion of England possesses a copious and highly diversified Flora. The variety of exposure and situation adapted to the growth of different plants, arising from the height of the mountains and extent of level ground at their base, its shady and damp woods, slow streams, deep and cold lakes, besides the extent of sea coast, in some measure counteracting our distance from the equator, by which the number of species belonging to both the vegetable and animal kingdoms are regulated. Another cause of the diversity of our vegetable productions, I conceive to be the variety of soils, owing to the decomposition of the several formations of rocky strata, for notwithstanding the high authority of De Candolle, I cannot help thinking that the chemical character of soils has a direct, as well as an indirect influence, on the reproduction and health of many plants.

The whole number of vegetables detected in Great Britain and Ireland, scarcely exceeds 3,000 of which two-thirds are to be found in the three northern counties. The plants of frequent occurrence in the southern and western parts of the kingdom which do not occur in this district, are the spreading and nettle-leaved Bellflower (*Campanula patula* and *Campanula Trachelium*),

the pale smooth-leaved Willow-herb (*Epilobum roseum**), the Navel Wort (*Cotyledon Umbellatus*), the Traveller's Joy (*Clematis Vitalba*), several species of *Verbascum*, some Mints, the lesser Broom-rape (*Orobancha minor*), which is a destructive weed in Surrey and Sussex by attaching itself to the roots of the clover, and the greater Dodder (*Cuscuta europæa*), entwining Tansy, Nettles, &c. To these may be added some few rare plants from the Pyrenees, which reach Cornwall and Devonshire; and others, like the Box, attached to the chalky soil of Surrey, Kent, Hampshire, and Sussex: but there is not a numerous genus in the island, of which we do not possess some species.

Though observations upon organic remains may appear out of place among minutes intended to illustrate the geography of plants, yet it may not be amiss to remark, that not one of the vegetables which have left impressions on our shale, sandstones, and coal, or on the alum shale, and sandstones of the Lias formation near Whitby, are known to exist at the present day. The casts which frequently occur in this coal field are those of trunks of large trees, imbedded in sandstone and mineralized by siliceous matter, and their bark changed into coal, but to what species they belonged it is impossible even to conjecture, as no impressions of leaves remain; also short thick stems resembling those of the genus *Euphorbia* with scaly bark, some with broad spear-shaped leaves, and others with narrow recurved sedge-like leaves, Cacti with rose-shaped blossoms pressed close to their stems, pear-

* I have gathered this obscure species by a mill race near Dorking, Surrey.

shaped seed vessels of some unknown genus, impressions of a species of *Chara* and *Equisetum*, and of Ferns, resembling *Osmunda regalis*, *Blechnum boreale*, *Apidium Filix-mas*, *A. Filix-fœmina*, *A. Thelypteris*, *A. fragile*, *A. montanum*, *Asplenium Ruta muraria*, *A. erosum*, *Pteris cretica*, *P. caudata*, *P. arguta*, *Adiantum pedatum*, and *A. Capillus-veniris*, with Reeds gigantic in size, Cones of great length, and a Moss approaching to *Fontinalis antipyritica*, enclosed in shale, fire clay, sandstone, coal, iron pyrites, and in clay ironstone nodules. When erect, the Trees, *Euphorbiæ* and Reeds retain their proper shapes, but are always compressed when found in a horizontal position.

Note.—The coal shale of New South Wales contains impressions of the leaves of a phænogamous plant resembling some species of *Eucalyptus*.—See *Annals of Philosophy for May*, 1823.

Appendix.

No. I.

1. ROSA RUBELLA—RED-FRUITED DWARF ROSE.

Fruit oval, somewhat bristly. Flower stalks bristly. Stem spreading, clothed with straight slender spines.—Leaflets elliptical, smooth, singly serrated. Segments of the calyx entire.

Eng. Bot. t. 2, 521. With. ed. 6, v. iii, p. 613. Smith's Com. p. 78. Woods, in Linn. Trans. v. xii, p. 177. Lindley, p. 40. Sm. Eng. Fl. v. ii, p. 374.

Flowers white tinged with pink. Fruit, when ripe, pear-shaped, scarlet, and pendant. Calyx permanent.

This shrub appears a link between *Rosa spinosissima* and *Rosa alpina*; the latter of which it greatly resembles in habit. It is not *Rosa pimpinellifolia* of the Swiss Botanists, as Mr. Woods conjectures; for, by a specimen procured from Mr. Schleicher, that plant appears to be *Rosa spinosissima*. Nor is it *Rosa spinosissima*, var. 3, of Withering, as I am assured by that gentleman.

On the sands of the sea coast near South Shields, Durham, mixed with the dwarf variety of the Burnet Rose—rare.

2. ROSA SPINOSISSIMA—BURNET ROSE.

Fruit globose, smooth as well as the flower stalks.—Stem clothed with numerous straight slender spines. Leaflets singly serrated, smooth and round.

Eng. Bot. t. 187. With. ed. 6, v. iii, p. 612. Hooker, Fl.

Scot. p. 154. Greville's Fl. Edin. p. 111. Woods, in Linn. Trans. v. xii, p. 178. Fl. Brit. v. ii, p. 537.—Lindley, p. 50. Sm. Eng. Fl. v. ii, p. 375.

Rosa pimpinellifolia. Linn. Syst. Nat. ed. 10, p. 1,062. Schleicher's Catalogue, p. 24.

Flowers yellowish white. Fruit first reddish brown, as coloured in English Botany, and then turning black. Calyx permanent.

γ pusilla. Woods, in Linn. Trans. v. xii, p. 179.—Sm. Eng. Fl. v. ii, p. 376.

Flower stalks short Fruit large, depressed.

The Burnet Rose is a shrub of a very diminutive growth on the sea beach (var. *γ*), but rises to a tall bush in woods and hedges distant from the coast. It is not very common, but occasionally to be met with, even in the alpine vallies of Teesdale and Weardale; and in the woods bordering the Lakes of Cumberland and Westmoreland.

3. ROSA INVOLUTA—PRICKLY UNEXPANDED ROSE.

Fruit globose, prickly as well as the flower stalks.—Prickles of the stem numerous, and straight. Petals involute and imperfectly expanded. Leaflets elliptical, doubly serrated.

Eng. Bot. t. 2,068. Fl. Brit. v. ii, p. 398. With. ed. 6, v. iii, p. 613. Woods, in Linn. Trans. v. xii, p. 183. Sm. Eng. Fl. v. ii, p. 380. Hooker, Fl. Scot. p. 154.

Rosa Domiana? Woods, in Linn. Trans. v. xii, p. 185. Sm. Eng. Fl. v. ii, p. 378.

R. Sabini? Do. v. xii, p. 188. Sm. Eng. Fl. v. ii, p. 380. Lindley, p. 59. Hooker, Fl. Scot. p. 155. Greville's Fl. Edin. p. 112.

R. nivalis, *Hort. Cant. ed. 7, p. 155?*

Flowers pale pink; generally one, but sometimes two or three together. Petals yellowish at the base.—Fruit scarlet. Calyx permanent, entire.

I can observe not the slightest difference, except in size, between *Rosa involuta*, gathered by the late Mr. G. Donn, on the shores of Arran, and our plant. In woods and hedges, the shrub becomes taller and more slender, as is the case with *Rosa spinosissima*, under similar circumstances. The specific name is a bad one, for its petals are only sometimes involute, generally expanding like those of other roses.

In Heaton Dene, below Benton Bridge, and near Gold Spink Hall—rare.

4. *ROSA GRACILIS*—TALL BRISTLY ROSE.

Flower stalks bristly, generally bracteated. Branches globular; fruit and calyx bristly. Larger prickles hooked. Leaflets doubly serrated, hairy on both sides.

Woods, in Linn. Trans. Sec. v. xii, p. 186. Sm. Eng. Fl. v. ii, p. 379.

Rosa villosa. Eng. Bot. t. 583.

♂ flore albo.

In *♂* variety, the segments of the calyx are usually divided. It is by far the most elegant of the British Roses, and, were it not for its hooked prickles, comes very near to *Rosa involuta*, var. *♂* Sabini.

Var. *α*, at Baydales, near Darlington, according to Mr. J. Backhouse. In hedges three miles and a half from Keswick, on the Lorton or Cockermouth road, ascending Finlatter, where Mr. Woods observed it; and at Pooley Bridge.

Var. *β*, in Ennerdale.

Flowers generally solitary, but occasionally two or three together. Fruit scarlet.

5. *ROSA VILLOSA*—SOFT-LEAVED ROUND-FRUITED ROSE.

Fruit globose, half as long as the segments of the calyx, bristly as well as the flower stalks. Prickles of the stem straight. Leaflets elliptic, ovate, downy on both sides. Calix permanent.

R. villosa. Woods, in Linn. Trans. v. xii, p. 189.—*With. ed.* 6. v. iii, p. 612, var. 2. *Sm. Eng. Fl.* v. ii, p. 381.

Rosa villosa, β *Fl. Brit.* v. ii, p. 538.

Rosa mollis. *Eng. Bot. t.* 2, 459. *Geog. of Plants*, first ed. p. 42.

Rosa tomentosa, β *Lindley*, p. 77. *Fl. Scot.* p. 156.

R. villosa mollissima, β *Willd. Sp. Pl.* v. ii, p. 1,070 ?

When this shrub grows on a sterile soil, or in a bleak, exposed situation, it assumes the stunted habit and full red flower, as delineated in *Eng. Bot. t.* 2, 459. The fruit varies from smoothness to a considerable degree of roughness. *Rosa villosa*, of Dr. Swartz, and other foreign botanists, is the Apple Rose of our gardens, which I believe is not indigenous. Its fruit is very large, and leaves pointed.

Very common about Newcastle, in hedges and woods.

6. *ROSA TOMENTOSA*—DOWNY-LEAVED DOG ROSE.

Fruit ovate, bristly as well as the flower stalks.—Prickles of the stem hooked. Leaflets doubly serrated, ovate, downy on both sides. Divisions of the Calyx permanent.

Eng. Bot. t. 990. *Fl. Brit.* v. ii, p. 539. *With. ed.* 6, v. iii, p. 615. Woods, in Linn. Tr. v. xii, p. 197.—*Lindley*, p. 27. *Sm. Eng. Fl.* v. ii, p. 383.

Flowers bright red, paler at the base. Calyx deciduous.

In woods and hedges about Newcastle—by no means rare.

7 ROSA SCABRIUSCULA—ROUGH-LEAVED DOG ROSE.

Fruit, roundish, ovate, bristly as well as the flower stalks. Prickles awl-shaped, as well as the flower stalks. Leaflets doubly serrated, elliptical, with minute hairs.—Divisions of the Calyx permanent.

Eng. Bot. t. 1,896. Woods, in Linn. Trans. v. xii, p. 193. Smith's Compend. p. 78. With. ed. 6, v. iii, p. 615.

R. tomentosa β , *Sm. Eng. Fl. v. ii, p. 383.*

Fruit red. Bristles on the fruit and flower stalks ending in minute glands; but there is a variety with smooth fruit. Leaflets more pointed than represented in *Eng. Botany*, and covered with a hoary, velvety down.

The buds are peculiarly handsome when sufficiently expanded to shew the bright red tints with which the outer edge of the snow-white Petals are marked. Probably Sir J. E. Smith is right in considering this Rose a variety of *Rosa tomentosa*; but I shall let it stand as a species, till the contrary be proved by sowing its seeds.

In woods and hedges, about Newcastle, not uncommon.

8. ROSA EGLANTERIA—SWEET BRIAR.

Fruit ob-ovate, bristly as well as the flower stalks.—Leaves doubly serrated. Prickles of the stem hooked, clothed beneath with rusty-coloured glands. Segments of the Calyx deciduous.

Huds. Fl. Ang. p. 218. Woods, in Linn. Trans. v. xii, p. 206.

Rosa rubiginosa. Eng. Bot. t. 991. Fl. Brit. v. ii, p. 540. With. ed. 6, v. iii, p. 616. Sm. Eng. Fl. v. ii, p. 385. Lindley, p. 86. Hooker, Fl. Scot. p. 157. Greville's Fl. Edin. p. 113.

Flower pale red, fruit scarlet.

This shrub may occasionally be met with on our ballast hills or in hedges. I suspect it was not originally indigenous in the north, but has, in the first instance, been brought from the south of England: the chalk hills of Surrey and Kent appearing to be the original localities of the Eglantine.

9. *ROSA BORRERI*—DOWNY-STALKED DOG ROSE.

Fruit ovate, smooth. Flower stalks villous, somewhat bristly, clustered. Prickles of the stem hooked. Leaflets ovate, doubly serrated, slightly hairy beneath. Foot-stalks very downy.

Woods, in Linn. Trans. v. xii, p. 210.

R. dumetorum. Eng. Bot. t. 2, 579. Smith's Compend. p. 79. With. ed. 6, v. iii, p. 618. Sm. Eng. Fl. v. ii, p. 388.

Rosa rubiginosa inodora. Hooker, Fl. Lond. t. 117.

Fruit scarlet, ovate. Petals pale pink, yellowish at the base.

This Rose is accurately delineated in the English Botany, but the calyx remains long on the fruit. No doubt can exist of its being different from every other British species. Like *Rosa canina*, it frequently throws out long leading shoots, which soon overtop the bunches of flowers. By specimens from Dr. Swartz, I am certain it is not *Rosa dumetorum* of that author.

In a hedge on Friar's Goose Quay, probably brought thither with ballast from the south of England.

10. *ROSA BRACTESCENS*—BRACTEATED DOWNY ROSE.

Fruit globose, smooth. Flower stalks aggregate, occasionally somewhat hairy. Calyx pinnate, with entire

segments. Prickles aggregate, hooked. Leaflets ovate, almost simply serrated, downy beneath. Bracteas rising much above the fruit.

Woods, in Linn. Trans. v. xii. p. 216. Sm. Eng. Fl. v. ii, p. 391.

About Ambleside, Westmoreland.—*Mr. Jos. Woods.*

The foregoing specific character, extracted from the English Flora of Sir J. E. Smith, agrees with a specimen of this Rose, sent me several years since by Mr. Woods; but I have not been so fortunate as to observe the plant growing in Cumberland or Westmoreland.

11. ROSA DUMETORUM—THICKET ROSE.

Fruit elliptical, smooth, as tall as the bracteas. Flower stalks aggregate, slightly hairy. Calyx pinnate. Prickles numerous, scattered, hooked. Leaves simply serrated, hairy on both sides.

Woods, in Linn. Tr. v. xii, p. 217. Sm. Eng. Fl. v. ii, p. 392. Lamark and De Candolle, Fl. Fr. v. iv, p. 534, according to specimens from Schleicher.

Bracteas serrated, pointed and leafy, longer than the flower stalks, which are short and stout, sometimes four or five together. Tube of the calyx roundish. Segments pinnate, permanent. Flowers pale red. Styles prominent, hairy. Stigmas forming a round head.—Fruit red, globular.—The foregoing correct description, chiefly drawn from the English Flora of Sir J. E. Smith, it is impossible to amend, though numerous specimens lie before me.

In Heaton Dene, and hedges near Sandiford, Northumberland—rare.

12. *ROSA CANINA*—COMMON DOG ROSE.

Fruit ovate, smooth as well as the flower stalks.—Prickles of the stem hooked. Leaflets ovate, pointed very smooth, singly serrated.

Eng. Bot. t. 992. Fl. Brit. v. ii, p. 540. With. ed. 6, v. iii, p. 617. Woods in Linn. Trans. v. xii, p. 223. Sm. Eng. Fl. v. ii, p. 394. Hook. Fl. Scot. p. 157. Greville's Fl. Edin. p. 113.

Flowers pale pink, clustered, soon out-topped by the leading shoots of the shrub, in which it resembles *Rosa Borreri*. Fruit scarlet, oval. Calyx deciduous. Leaves dark shining green. The young shoots very strong, armed with large hooked prickles.

In every hedge about Newcastle.

13. *ROSA SARMENTACEA*—GLAUCUS-LEAVED DOG ROSE.

Calyx permanent. Fruit egg-shaped, smooth. Leaflets ovate, doubly serrated, glaucous. Prickles hooked. Calyx deciduous.

R. sarmentacea. Woods, in Linn. Trans. v. xii, p. 213. Swartz. MSS.

Rosa glaucophylla. Geog. of Plants, first ed. p. 45. With. ed. 6, v. iii, p. 619.

This is a much slenderer, though less trailing Briar than *Rosa canina*; its flowers pale pink, growing in pairs or single, and its fruit large. It also further differs in habit, by not having young shoots sprouting beyond the blossoms, so as to give them the appearance of being axillary; and from *Rosa sentriosa* of Acharius (Stockholm Transactions) in the fruit being ovate, not globular. The leaves of the shrub are glaucous—peculiarly so in the spring of the year; and

with reluctance I relinquish the name given to it in the first edition of this pamphlet, for the less appropriate one of my late friend, Dr. Swartz.

Every hedge near Newcastle, both in Northumberland and Durham.

14.* *ROSA ARVENSIS*—WHITE TRAILING DOG ROSE.

Style united. Fruit globose, smooth as well as the flower stalks. Leaves unequally serrated. Stem and leaf stalks prickly. Flowers generally clustered.—Prickles hooked.

Eng. Bot. t. 188. Fl. Brit. v. ii, p. 538. With. ed. 6, v. iii, p. 611. Woods, in Linn. Trans. v. xii, p. 232. Sm. Eng. Fl. v. ii, p. 396. Linley p. 112. Hooker, Fl. Scot. p. 158. Greville's Fl. Edin. p. 114.

Var. α Hudson. With only one flower.

Flowers white. Germen oblong. Fruit globose, deep red, terminated by the simple base of the styles.—Calyx deciduous. Stems glaucous, sometimes the colour of mahogany.

The foreign Botanists do not seem to be well acquainted with this species, some of them considering it the same as *Rosa sempervirens*, from which it is easily distinguished by the more oval form and colour of its leaves, and the calyx being quite smooth. From Dr. Swartz I have received specimens of a rose named *Rosa arvensis*, but which resembled a small variety of *Rosa canina*, and is *Rosa agrestis* of Schleicher's Catalogue of Swiss Plants. The Ayrshire Rose, which may frequently be seen trained against walls, is scarcely a variety.

Var. α, about Darlington and Norton, Durham. *Var. β*, near Elswick, at St. Anthon's, at Friar's Goose, and other places in the vicinity of Newcastle.

* At p. 3, thirteen species of the genus *Rosa*, instead of fourteen, were mentioned.

No. II.

I AM indebted to the kindness of Mr. Losh for allowing me to extract the data on which the following table of the temperature of the atmosphere in lat. 55, is founded, from a meteorological register kept by him at Jesmond, for several years past. The height of the thermometer was noted each day at 9, 2, and 11 o'clock, so that the result is drawn from upwards of 2,500 observations.—The elevation of Jesmond is about 200 feet above the level of the sea ; and it is distant from the coast between seven and eight miles :

	1812.	1813.	1814.	1815.	1816.	1817.	1818.
January	36½	36¾	28½	33½	37	40½	38
February	40¼	43¼	35¼	43	36	43	32

Note.—Owing to the extreme mildness of the winter of 1821–22, in the North of England, the following autumnal and spring flowers were noticed to blossom in sheltered gardens through the whole season :—the Chinese blush Rose, Jasmine, Mignonette, purple flowery Groundsel, Hearts-ease, Stocks, Carnations, Hollyhocks, Colchicum, Cantabury Bells (*Campanula Medium*), Wall-flowers, Auricula, Gentianilla (*Gentiana acaulis*), Violets, Anemonies, early-flowered dwarf Heath (*Erica carnea*), Cornish Heath (*Erica vagans*), Japan Quince (*Cydonia speciosa*), with some species of *Primulæ*, besides several late flowering Asters and Golden Rods, natives of North America.

	1812.	1813.	1814.	1815.	1816.	1817.	1818.
March	37 $\frac{1}{2}$	45	38 $\frac{1}{2}$	43 $\frac{1}{2}$	37 $\frac{1}{2}$	41 $\frac{1}{2}$	38 $\frac{1}{2}$
April	42	47	50 $\frac{1}{4}$	46 $\frac{1}{2}$	41	46 $\frac{1}{4}$	42
May	51	52 $\frac{1}{4}$	47 $\frac{1}{4}$	53 $\frac{1}{2}$	48 $\frac{3}{4}$	49	51
June	56 $\frac{3}{4}$	56 $\frac{1}{2}$	53	57 $\frac{1}{4}$	54 $\frac{3}{4}$	57 $\frac{1}{4}$	62 $\frac{1}{4}$
July	57 $\frac{1}{4}$	60 $\frac{3}{4}$	60 $\frac{1}{2}$	58	56 $\frac{1}{4}$	57 $\frac{1}{4}$	63
August	58	58	60 $\frac{1}{4}$	59	56 $\frac{3}{4}$	55 $\frac{3}{4}$	58
September	55 $\frac{3}{4}$	56 $\frac{1}{4}$	56 $\frac{1}{4}$	56 $\frac{1}{2}$	52	55 $\frac{1}{4}$	55 $\frac{1}{2}$
October	49	47	48	50 $\frac{1}{4}$	44	44	53 $\frac{1}{4}$
November	42	40	41 $\frac{3}{4}$	43	39 $\frac{1}{4}$	45 $\frac{3}{4}$	48 $\frac{3}{4}$
December	37	39 $\frac{3}{4}$	38 $\frac{1}{2}$	33	36 $\frac{3}{4}$	35	40 $\frac{3}{4}$
	<u>47</u>	<u>48$\frac{1}{2}$</u>	<u>46$\frac{1}{2}$</u>	<u>48$\frac{1}{2}$</u>	<u>45$\frac{1}{2}$</u>	<u>47$\frac{1}{2}$</u>	<u>49$\frac{1}{2}$</u>

Average temperature of seven years 47 $\frac{1}{2}$ °.*

The range of temperature of the springs in this neighbourhood has been, for the preceding twelve months, from 42° to 49 $\frac{1}{2}$ °. Those which appear most regular are, the Cradle Well, by the road to Jesmond, and the Holy Well, in Jesmond Dene, the courses of which must be in the seventy fathom Post, as the miners call it. This stratum of sandstone is nearly 50 feet thick,

* Edinburgh lat. 55° 47', mean temperature 47° 8'.

This calculation has been made from six years' excellent observations, by Professor Playfair; during this time, the thermometer was never seen above 75° 8'. Vegetation continues from March 20th to October 20th. The mean temperature of these seven months is from 55° 8' to 50° 9'; accordingly, the years are more or less fruitful: wheat does not ripen if the mean temperature descends to 47° 6'. The mean heat of the summers of Scotland in the environs of Edinburgh, is found again on the Table lands of New Grenada, so rich in wheat, at 1,400 toises of elevation, and at 4° of north latitude.—*Humboldt*.

Keswick lat. 54° 33', mean temperature 48°	} —Dalton.
of Springs	
46. 6'	
Kendal 54° 17',	
of Springs	
46. 2	
47. 2	

and crops out on the south-west side of the town moor, covering the high main seam of coal, which has been worked out from under the springs; and as the old colliery is now drained, the water cannot rise from below the coal.

During the month of April, 1818, the Jesmond Springs

stood at	42°
On the 19th of May, at	44
On the 1st of June, at	46
On the 10th of June, at	47
On the 15th of July, at	48
On the 28th of ditto, at	49
On the 6th of September, at	49½
On the 1st of November, at	49
On the 15th of ditto, at	48
On the 15th of December, at	45
On the 17th of January, at	44
On the 27th of ditto, at	43
On the 5th of March, at	42

Mean temperature, ascertained by fifty observations, 45¾°.

From a spring rising in the higher part of Newcastle, at an elevation of 180 feet above the level of the sea, the following less correct results were obtained, owing to its flowing for some distance nearer the surface of the earth :

During the month of April, 1818, the temperature

was	42°
On the 19th of May,	46
On the 1st of June,	48
On the 10th of ditto,	50
On the 15th of July,	52
On the 28th of ditto,	54
On the 6th of September,	56
On the 1st of November,	53

On the 15th of ditto,	51°
On the 15th of December,	47
On the 17th of January,	44
On the 27th of ditto,	43
On the 5th of March,	42

Mean temperature 49°.

The mean temperature of the surface of the Tyne, taken in the middle of the river between Wallsend and Hebburn Staith, by Mr. Buddle:

From the 12th of May to Sept. 15th, 1817, . . .	49½°
From the 12th of Jan. to Feb. 9, 1818, . . .	34½

When the temperature of the river was 36° in water clear of ice, it was only 30° among drift ice, February 9, 1818.

The temperature of the air and of the water issuing into the shaft at Hebburn Colliery:

At the surface, the air	48°	
At 12 fathoms,	48	
At 52 fathoms,	48	water 54°
At 97 fathoms,	54	58
At 130 fathoms,	58	60

The temperature of water issuing from a waste in Hebburn Coal Mine at the depth of 130 fathoms . . . 68

The temperature of the same water at 150 fathoms . . . 68

The temperature of the air in the mine, in the main air-course, at the depth of 130 fathoms and 150 yards from the shaft 65

The temperature of the atmospheric air 44

The experiments were made by Mr. Dunn, April 24th and 30th, 1819.

The temperature of a spring of water issuing into a pit at Pontop Colliery, at 63 fathoms, was ascertained

by Mr. Fenwick to be 54° , while the temperature of the mine was 73° .^{*}—April, 1819.

* According to observations made in the mine of Wheal Abraham, in Cornwall, by Mr. McLean, and published in the Philosophical Magazine in December, 1815, the temperature of the water,

At 100 fathoms, was 64° —of the air 66°			
At 120	—————	68	————— 70
At 140	—————	72	————— 72
At 200	—————	78	————— 78

FINIS.

